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ACKENHEIL AND ASSOCIATES INC BALTIMORE MD
NATIONAL DAM INSPECTION PROGRAM, LOST CREEK DAM MCKEESPORT Y.M.--ETC(U)
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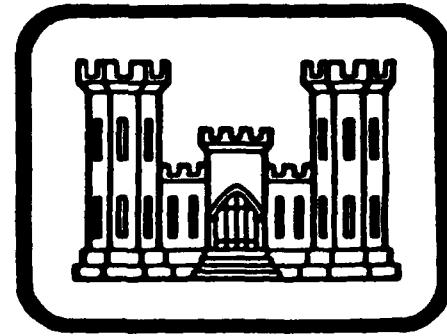
PENNSYLVANIA

NDI ID. NO. PA 739
Penn. DER NO. 56-83

LOST CREEK DAM

MCKEESPORT Y.M.C.A.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



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PREPARED FOR

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
BALTIMORE, MARYLAND 21203

BY

ACKENHEIL & ASSOCIATES, BALTIMORE, MD, INC.
7902 BELAIR ROAD
BALTIMORE, MARYLAND 21236

ARCH 1980

ACKENHEIL & ASSOCIATES

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(6) National Dam Inspection Program. Lost Creek Dam (NDI ID Number PA-739 Penn DER Number 56-83), Ohio River Basin, Lost Creek, Somerset County, Pennsylvania. Phase I Inspection Report.

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase 1 investigations. Copies of these guidelines may be obtained from the Department of the Army, Office of Chief of Engineers, Washington, D.C. 20314.

McKeesport Y.M.C.A.

The purpose of a Phase 1 investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon visual observations and review of available data. Detailed investigation and analyses involving topographic mapping, subsurface investigations, material testing, and detailed computational evaluations are beyond the scope of a Phase 1 investigation; however, the inspection is intended to identify any need for such studies which should be performed by the owner.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of the dam depends on numerous and constantly changing internal and external factors which are evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase 1 inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" (PMF) for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition, and the downstream damage potential.

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PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

SYNOPSIS OF ASSESSMENT AND RECOMMENDATIONS

NAME OF DAM:	Lost Creek Dam
STATE LOCATION:	Pennsylvania
COUNTY LOCATION:	Somerset
STREAM:	Lost Creek, a tributary of the Casselman River
DATES OF INSPECTIONS:	November 20, 1980, and March 4, 1980
COORDINATES:	Lat. 39° 57.3', Long. 79° 14.9'

ASSESSMENT

Lost Creek Dam is classified as a "small" size, "significant" hazard dam in accordance with U. S. Army Corps of Engineers dam safety criteria.

Based on the evaluation of available design information and visual observations of conditions as they existed on the dates of the field reconnaissances, the general condition of Lost Creek Dam is considered to be good. Wet zones, observed located at the downstream embankment toe, are believed attributable to surface runoff, and are not considered significant relative to dam stability at the present time. However, seepage emanating along the reservoir drain pipe outlet may represent a potential hazard to the dam. The cause and origin of this seepage could not be conclusively established by visual observation and review of construction documents. Therefore, periodic monitoring of the seep is recommended.

The presence of tire ruts, tree and woody shrub growth, shallow depressions, and localized slope disturbance, are considered minor deficiencies in need of maintenance.

Guideline criteria recommends spillway design floods of 100 year to 50 percent PMF for "small" size, "significant" hazard dams. Based upon the observed downstream hazard potential, a 50 percent PMF spillway design flood is considered appropriate for Lost Creek Dam. Analysis utilizing the HEC-1 Dam Safety computer program indicates the dam is overtopped by 0.07 ft. of water for an estimated flow duration of 1.0 hour for 50 percent PMF conditions. The depth and duration of this overtopping is not believed sufficient to initiate breaching of the dam. Therefore, spillway discharge capacity (approximately 49 percent PMF) is assessed inadequate, but not seriously inadequate, in accordance with guideline criteria.

RECOMMENDATIONS

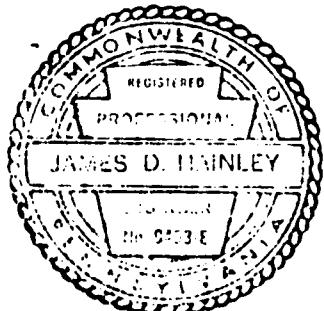
The following recommendations should be implemented as soon as possible:

1. Implement study to more accurately ascertain the potential for spillway blockage and bridge collapse, and the extent of improvements required to provide sufficient protection against spillway blockage.

Lost Creek Dam
NDI ID No. PA 739

RECOMMENDATIONS (cont.)

2. Develop and institute a flood surveillance, warning, and evacuation plan.
3. Monitor seepage and wet zones located downstream of the embankment toe for change in conditions. If increased flow quantity or evidence of erosion is observed, immediately notify Department of Environmental Resources, Dam Safety Division.
4. Backfill dam crest with suitable material, compact, and level to original grade.
5. Remove tree and woody shrub growth along spillway channel sidewalls and dam embankments.
6. Backfill, mulch, and seed embankment surface erosion along the spillway-embankment junction sidewall.
7. Provide suitable protective trash screens for 2 in. and 18 in. dia. drain pipe inlets.
8. Develop and implement method for upstream closure of 2 in. dia. C. I. drain pipe.
9. Regrade, compact, and seed localized slope disturbance on downstream embankment slope near spillway-embankment junction.
10. Limit vehicular travel on dam crest or provide a suitable road surface.



James D. Hainley, P.E.
PA Registration No. 9453
Vice President

Date

Timothy E. Debe
Project Engineer

Date

APPROVED BY:

James W. Peck
Colonel, Corps of Engineers
District Engineer

9/11/80
Date

LOST CREEK DAM



OVERVIEW OF DAM

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PHASE 1 REPORT
NATIONAL DAM INSPECTION PROGRAM
LOST CREEK DAM
NDI ID. NO. PA 739

SECTION 1
PROJECT INFORMATION

1.1 GENERAL

- A. AUTHORITY: This study was performed pursuant to the authority granted by the National Dam Inspection Act, Public Law 92-367, to the Secretary of the Army, through the Corps of Engineers, to conduct inspections of dams throughout the United States.
- B. PURPOSE: The purpose of this study is to determine if the dam constitutes a hazard to human life or property.

1.2 DESCRIPTION OF PROJECT

A. DAM AND APPURTENANCES

- 1. Embankment: Lost Creek Dam was constructed as a zoned earthfill structure. The dam embankment consists of an impervious clay core extending from dam foundation to crest, and upstream and downstream embankment shells. Lost Creek Dam has a maximum toe to crest height of 18 ft., a crest width of 10 ft., and is 315 ft. long. The upstream embankment slope is inclined 2H:1V from the crest to El. 1836, and 2.5H:1V from El. 1836 to normal pool level. The downstream embankment slope has an inclination of 2H:1V. A layer of rock riprap has been placed on the upstream slope extending from the dam foundation (El. 1821+) to 3 ft. below dam crest (El. 1836.4).
- 2. Seepage Control Provisions: According to construction drawings, a cutoff trench backfilled with compacted clay was constructed along the centerline of the dam. No other seepage control provisions are indicated by construction drawings.
- 3. Flood Discharge Facilities: Flood discharge facilities consist of a spillway channel excavated into the left abutment and 18 in. and 2 in. dia. reservoir drain pipes. Overflow is controlled by a 45 ft. long concrete weir with a crest elevation of 1832.5. The spillway channel section is rectangular in shape and has concrete lined bottom and sidewalls. The reservoir drains consist of an 18 in. dia. corrugated metal pipe and 2 in. dia. cast iron pipe encased in concrete. The 18 in. and 2 in. dia. pipes are controlled by an upstream drain plug and a downstream gate valve, respectively. The 18 in. dia. pipe serves as the principle reservoir drain outlet, whereas the 2 in. dia. pipe serves as a "dry weather" water release outlet.

B. LOCATION: Lost Creek Dam is situated on Lost Creek, a south flowing tributary of Laurel Hill Creek and the Casselman River. The dam is located approximately 1.25 miles northwest of New Lexington, Pennsylvania. (Refer to Location Plan, Appendix E.)

C. SIZE CLASSIFICATION: Based on a maximum toe to crest height of 18 ft. and a maximum storage capacity of 270 ac.-ft., the dam is accordingly classified as a "small" size structure.

D. HAZARD CLASSIFICATION: Lost Creek Dam is classified in the "significant" hazard category. In the event of dam failure, damage to the recreational area, state roads, and farmland would be expected. The possibility of loss of human life is considered slight.

E. OWNERSHIP: Lost Creek Dam is owned by the Young Men's Christian Association, McKeesport, Pennsylvania. All correspondence concerning the maintenance and operation of the dam should be directed to Rodney J. Shegan, Chairman, Young Men's Christian Association, 523 Sinclair Street, McKeesport, Pennsylvania.

F. PURPOSE OF DAM: Lost Creek Dam was constructed for purposes of recreation and providing a water supply for fire protection.

G. DESIGN AND CONSTRUCTION HISTORY: The dam was designed and constructed under the supervision of Neilan Engineers, Somerset, Pennsylvania. Construction of the dam was started November 23, 1953, by Lomb, Collins, and Troll Contractors, Somerset, and completed August 6, 1954.

H. NORMAL OPERATING PROCEDURE: Lost Creek Dam was designed as an uncontrolled structure. Under normal operating conditions, reservoir level is maintained by passage of normal base flow over the spillway channel weir crest.

1.3 PERTINENT DATA

A. <u>DRAINAGE AREA</u>	3.0 sq. mi.
B. <u>DISCHARGE AT DAM FACILITY</u>	
Maximum known flood at dam facility	Unknown
Ungated spillway capacity	3025 cfs
C. <u>ELEVATION (FT. ABOVE MSL)</u>	
Constructed top of dam	1839.4 ft.
Spillway crest	1832.5 ft.
Normal pool	1832.5 ft.
Maximum tailwater	Unknown
Upstream invert of outlet pipe	1823.6 ft.
Downstream invert of outlet pipe	1820.0 ft.
Streambed at dam centerline	1821.4 ⁺ ft.

D. RESERVOIR LENGTH

Length of maximum pool	5550 ft.
Length of normal pool	2650 ft.

E. TOTAL STORAGE

Constructed top of dam	270 ac.-ft.
Spillway crest	77 ac.-ft.
Normal pool level	77 ac.-ft.
Sediment pool	Unknown

F. RESERVOIR SURFACE

Constructed top of dam	46 acres
Spillway crest	18 acres
Normal pool	18 acres
Sediment pool	Unknown

G. DAM

Type	Zoned Earthfill
Length	315 ft.
Height	18 ft.
Top width	10 ft.
Side slopes	
Downstream	2H:1V
Upstream (Design)	2H:1V
Upstream (Field)	2H:1V from crest to El. 1836 and 2.5H:1V from El. 1836 to normal pool level
Impervious core	Yes
Cutoff provisions	Compacted cutoff trench
Grout curtain	None

H. SPILLWAY CHANNEL

Type	Rectangular concrete channel
Width	45 ft.
Crest elevation	1832.5 ft.
Gate	None
Length of channel	75 ft.

I. RESERVOIR DRAIN

Type	Drop inlet with 18 in. dia. C.M. outlet pipe encased in concrete
Length	160 ft.
Plug	3/8 in. steel plate on neoprene rubber gasket

J. "DRY WEATHER" WATER RELEASE DRAIN

Type

Drop inlet with 2 in. dia.
cast iron outlet pipe
encased in concrete

157 ft.

Length
Gate

2 in. gate valve. Valve
located downstream of
dam crest.

SECTION 2
ENGINEERING DATA

2.1 DESIGN

A. DATA AVAILABLE: The following available data was obtained from the Pennsylvania Department of Environmental Resources, Dam Safety Division, Harrisburg, Pennsylvania.

1. Hydrology and Hydraulics: A design report for Lost Creek Dam was not available. Spillway channel discharge capacity, reservoir storage and surface area, and watershed drainage area, were obtained from "Report Upon the Request of Young Men's Christian Association of McKeesport, Pennsylvania," dated October 29, 1953. This report was prepared by the Dam Safety Division.
2. Embankment: Design information includes construction drawings entitled "Recreational Dam for Young Men's Christian Association of McKeesport", technical specifications, and memorandum construction reports prepared by Dam Safety Division personnel. Technical specifications were obtained from Technical Provisions, Part 1, Embankment, Spillway, and Appurtenances.
3. Appurtenant Structures: The documents identified in Section 2.1-A1 and A2 include construction drawings and technical specifications for spillway and appurtenant construction.

B. DESIGN FEATURES: Dam and appurtenances were designed in accordance with Department of Forests and Waters (currently Department of Environmental Resources) criteria. Illustrations of principal design features are shown on Plate Nos. 1 through 3.

1. Embankment: Foundation preparation for construction of the dam embankment involved clearing, grubbing, and removing of top soil and/or unsuitable material. The dam embankment was constructed with soil material obtained from spillway excavation and borrow pits excavated within reservoir site limits. Impervious clay soil was reportedly used to construct the embankment core. According to construction drawings, the clay core tapers from 15 ft. wide at dam foundation to 8 ft. at dam crest. Core side slopes are inclined 1H:5V. Clay, sand, and gravel soil mixtures were reportedly used to construct the upstream embankment shell. A more pervious sand, gravel, and clay soil mixture was used to construct the downstream embankment shell. End dumped 18 in. dia. riprap was placed on a 2 in. blanket of stone on the upstream embankment slope. The embankment crest and downstream slope were mulched and seeded with grass.

2. Seepage Control Provisions: An earthfill cutoff trench with a 10 ft. wide bottom and 1H:1V side slopes was constructed along the embankment centerline. The cutoff trench extends a maximum of 3 ft. into clay shale and was reportedly backfilled with compacted clay soil.
3. Flood Discharge Facilities: The spillway channel is 45 ft. wide and has 6.5 ft. high, vertical sidewalls. Concrete spillway channel measures 75 ft. in length and has a positive slope of 5 percent. A steel beam and wood plank bridge span the spillway channel at the location of the weir crest. Spillway flows are discharged 200 ft. downstream of the dam into the natural stream channel.

Reservoir drain pipes are encased in concrete and include anti-seep collars spaced at 18 and 25 ft. intervals. The drain plug for the 18 in. dia. outlet pipe consists of a 3/8 in. steel plate with a neoprene rubber gasket. The plug is located at the upstream embankment toe, approximately 110 ft. to the right of the spillway channel. The 2 in. dia. drain pipe is controlled downstream of the dam crest by a 2 in. dia. gate valve. Reservoir drain pipes outlet directly into the natural stream channel.

2.2 CONSTRUCTION: Field observations and available construction documents indicate that the dam was constructed in general accordance with design plans and specifications except as noted below. According to memorandum reports prepared by Dam Safety Division personnel, the following are revisions to the original design plans:

- A. Embankment soil materials were not compacted by a sheepfoot roller as required by specifications.
- B. The 2 in. gate valve box with extendable stem was not installed as shown on construction drawings.
- C. A steel beam and wood plank bridge was constructed across the spillway channel.
- D. Concrete spillway channel bottom and sidewalls were extended to below the downstream embankment toe.

There is no record of any additional modifications made to the dam after completion of construction in August, 1954.

2.3 OPERATION: The Young Men's Christian Association of McKeesport, Pennsylvania is responsible for the operation of Lost Creek Dam. Jesse Klink, Grounds Superintendent, in charge of camp and dam maintenance, is locally responsible for the operation of the reservoir drain plug and "dry weather" water release pipe. Both drain pipes are reportedly operational.

2.4 EVALUATION

- A. AVAILABILITY: All available construction information and drawings were provided by the Pennsylvania Department of Environmental Resources, Dam Safety Division.
- B. ADEQUACY: The construction drawings and design data provided are reasonably documented and are considered adequate to evaluate the dam and appurtenant structures in accordance with the scope of a Phase 1 study. Based on the review of this data, the dam and appurtenant structures are considered to have been designed in general conformance with accepted engineering practice.
- C. VALIDITY: At this time, there is no observable evidence or reason to question the validity of the available construction information and drawings.

SECTION 3
VISUAL INSPECTION

3.1 FINDINGS

A. GENERAL: The on-site reconnaissance of Lost Creek Dam consisted of:

1. Visual observations of the earth embankment, abutments, and spillway channel.
2. Visual observations of exposed sections of the reservoir drain inlets and outlets, reservoir shoreline and slopes, and downstream channel.
3. Visual observations of discernible hazardous conditions or safety deficiencies.
4. Evaluation of the downstream hazard potential.
5. Transit stadia survey of relative elevations along the embankment crest centerline, spillway, and across the embankment slopes.

Visual surveys were performed during periods when reservoir and tailwater were at normal pool levels.

A visual observation check list and field sketch are given in Appendix A. Specific observations are illustrated in photographs of Appendix C.

B. EMBANKMENT

1. Embankment Surface: The downstream embankment slope has a field measured 2H:1V inclination, dense grass covering, and appeared stable. Excavations for spillway sidewall repair have created a localized disturbed surface area on the downstream embankment slope near the spillway-embankment junction. The upstream slope has field measured inclinations of 2H:1V from dam crest to El. 1836, and 2.5H:1V from El. 1836 to normal pool level (El. 1832.5). A blanket of 18 in. dia. rock riprap was observed to extend from reservoir drain inlet level to 3 ft. below dam crest on the upstream slope. Tree and woody shrub growth was observed on both embankment slopes.

An unpaved access road, with deep tire ruts, extends across the full length of the dam crest. This access road is reportedly infrequently used by the Grounds Superintendent. A shallow, settled depression is located at the junction of the dam crest and bridge deck.

2. Seepage: Seepage was observed emanating from along the south side of the 18 in. dia. C.M. outlet pipe. The

seepage discharge was observed free of fine soil material, and had an estimated flow rate of 3 gpm.

3. Wet Zones: A wet zone, measuring approximately 25 ft. by 60 ft. was observed near mid-dam, approximately 50 ft. below the downstream embankment toe. Also, ponded water was observed located to the left of this wet zone, between 10 and 35 ft. below the downstream toe. No active seepage discharge was discernible at either location. Both wet zones are situated in a topographic low and are believed caused by surface runoff.

C. APPURTENANT STRUCTURES

1. Spillway Channel: Spillway channel bottom and sidewalls are lined with concrete and appear structurally sound. There was no observed evidence of significant cracking or spalling on exposed concrete surfaces. Spillway approach and exit channel sections were found free of debris and flow obstructions.

The right spillway channel sidewall appears to tilt slightly towards the open spillway channel. Trees and woody shrubs are located along this spillway channel sidewall and also along the spillway-abutment junction sidewall. Surface slope erosion is evident along the spillway-embankment junction sidewall.

2. Outlet Works: On the March 4, 1980, field reconnaissance the reservoir drain plug was found removed from the 18 in. dia. outlet pipe. Reservoir pool level had been lowered to E1. 1823.6. At this time, the previously submerged 18 in. dia. C.M. and 2 in. dia. C.I. pipe inlets were found not to have protective trash screens to reduce the risk of clogging. However, pipe inlets were observed free of debris and flow obstructions and appeared in good condition.

D. RESERVOIR AREA: Visual observations and a map review indicate that the watershed cover complex consists predominately of forest and open pasture. Reservoir slopes and shoreline appeared stable, exhibiting no significant evidence of erosion or slope instability. Sediment from cultivated farmlands located upstream are reportedly transported by Lost Creek into the reservoir.

E. DOWNSTREAM CHANNEL: The immediate downstream channel reach is about 15 ft. wide and has stable side slopes. There were no observed conditions in the downstream channel that might cause flow obstruction and present hazard to the dam.

Downstream from the dam, Lost Creek meanders approximately 1.2 miles in a southwest direction before it forms a confluence

with Laurel Hill Creek. Only one (1) inhabited structure is located within the estimated flood plain limits of Lost Creek. The nearest community is Metzler, Pennsylvania, which is located approximately 3.4 miles downstream of the dam embankment.

3.2 EVALUATION

A. EMBANKMENT

1. Embankment Surface: The observed deficiencies, consisting of tire ruts, tree and woody shrub growth, shallow depression on dam crest, and localized slope disturbance on the downstream embankment slope, are surficial in scope and are not considered significant relative to the overall stability of the dam. However, these deficiencies should be repaired as soon as possible. The dam crest is also in need of repair, and should be backfilled with suitable material, compacted, and leveled to original grade. In general, the embankment slopes are adequately maintained and appear in good condition.
2. Seepage: The cause and origin of the seepage observed at the reservoir drain pipe outlet could not be conclusively established by visual observation and review of construction documents. It is therefore recommended the seepage be periodically monitored by the Grounds Superintendent to note any change in condition. If an increase in flow quantity, or evidence of erosion is observed, the Department of Environmental Resources, Dam Safety Division should be notified immediately, and necessary corrective repairs made.
3. Wet Zones: The observed wet zones, located near the downstream embankment toe, are situated in a topographic low and are believed attributable to surface drainage. Since no active seepage is visually associated with these wet zones, the zones are not considered to represent a significant hazard to the dam. However, the wet zones should be periodically observed by the Grounds Superintendent to note any change in conditions.

B. APPURTENANT STRUCTURES: Slope erosion along the spillway-embankment junction sidewall should be backfilled, mulched, and seeded. Trees and woody shrubs along both spillway channel sidewalls will require removal. Suitable protective trash screens should be provided for the 2 in. dia. C.I. and the 18 in. dia. C.M. pipe inlets.

In general, the spillway channel bottom, sidewalls, weir crest, reservoir drain plug, and outlet pipes appeared in good condition.

SECTION 4
OPERATIONAL FEATURES

- 4.1 PROCEDURE: Under normal pool conditions, reservoir level is maintained at or below the weir crest of the spillway channel. The spillway channel is ungated and does not require a dam tender. The only operational features of the dam are a reservoir drain plug and a 2 in. gate valve, which are respectively used to drain the reservoir and provide "dry weather" discharge. The 2 in. gate valve is located downstream of the dam crest and is reportedly kept open at all times. The reservoir drain plug is removed and reinstalled annually.
- 4.2 MAINTENANCE OF DAM: The dam embankment and appurtenant structures are maintained by the camp's Grounds Superintendent, under the direction of the McKeesport, Young Men's Christian Association. Normal maintenance usually includes mowing embankment slopes, applying seed and fertilizer, regrading the dam crest and access road, and removing tree growth from embankment slopes.
- 4.3 INSPECTION OF DAM: Maintenance inspections are usually performed on a semi-annual basis by the Grounds Superintendent. The inspections generally consist of visually examining the dam embankment slopes and crest, spillway channel, outlet pipes, and making repair recommendations.
- 4.4 MAINTENANCE OF OPERATING FACILITIES: The reservoir drain plug is inspected and operated annually. The plug can be removed by a mechanical winch operated from the dam embankment. The 2 in. gate valve is normally kept open all year.
- 4.5 WARNING SYSTEM: There is no warning system or formal emergency procedure to alert downstream inhabitants of the threat of a dam failure.
- 4.6 EVALUATION: Maintenance and inspection procedures for the dam embankment and appurtenances at Lost Creek Dam are considered adequate. However, a method should be devised and implemented to allow for upstream closure of the 2 in. dia. C.I. drain pipe. Also, a formal flood surveillance, warning and evacuation plan is needed for the protection of downstream inhabitants.

SECTION 5
HYDROLOGY/HYDRAULICS

5.1 EVALUATION OF FEATURES

A. DESIGN DATA: Lost Creek Dam impounds an 18 acre lake with an estimated normal pool storage volume of 77 ac.-ft. and a top of dam storage volume of 270 ac.-ft. Design information indicates the spillway channel has a maximum discharge capacity of 2,800 cfs. However, field measurement of available freeboard height indicates a potential maximum discharge of 3,025 cfs.

Lost Creek Dam has a watershed drainage area of approximately 1920 acres and topographic relief ranging from El. 1821 to El. 2240. Watershed cover complex consists predominately of forest, with some open pasture, and little rural development. A small pond is located approximately 1 mile upstream from the dam. However, this pond is not considered to have a significant hydraulic effect on the operation and safety of the dam.

B. EXPERIENCE DATA: The U. S. Army Corps of Engineers dam safety guidelines recommend design storms of 100 year to 50 percent PMF (Probable Maximum Flood) for "small" size, "significant" hazard dams. Based on the observed hazard potential to downstream property and human life that would be expected in the event of a dam failure, a 50 percent PMF spillway design flood is considered appropriate.

Records have not been kept of reservoir stage elevations or rainfall amounts. However, during Hurricane Hazel, reservoir stage levels reportedly rose a maximum of 2 ft. above normal pool level. There is no record or report of the existing dam structure ever being overtopped.

The 50 percent PMF inflow hydrograph for the Lost Creek Dam watershed was modeled utilizing the HEC-1 Dam Safety Version computer program. This hydrograph was routed through the reservoir and dam spillway and produced a calculated 50 percent PMF outflow rate of 3,078 cfs.

C. VISUAL OBSERVATIONS: A wood plank bridge deck, supported by steel beams and columns, spans the spillway channel at the location of the weir crest. Two (2) steel column supports are located at mid-channel. It is believed wood debris carried from the surrounding forested watershed may be retained by the steel columns in the spillway channel and create a significant flow obstruction. Such an obstruction could possibly cause complete collapse of the bridge and further flow obstruction, and/or overtopping of the dam and breach failure. Field survey measurements indicate 6.9 ft. of freeboard is available for spillway discharge. Weir flow equation calculations indicate a potential maximum spillway discharge capacity of 3,025 cfs.

E. ADEQUACY OF SPILLWAY CHANNEL: Data previously developed indicates the spillway channel has a maximum unobstructed discharge capacity of 3,025 cfs, or about 49 percent PMF. The recommended spillway design flood for this facility is 50 percent PMF. Overtopping analyses indicate the dam is overtopped by 0.07 ft. of water for an estimated duration of 1.0 hour for 50 percent PMF conditions. Therefore, the unobstructed discharge capacity of the spillway channel is assessed inadequate in accordance with the U. S. Army Corps of Engineers dam safety criteria.

F. DOWNSTREAM CHANNEL: Downstream of the dam, Lost Creek empties into Laurel Hill Creek, about 2 miles north of Metzler, Pennsylvania. In the 1.2 mile channel reach between the dam and Laurel Hill Creek, one (1) inhabited structure is located within the estimated flood plain limits of Lost Creek. Damage to the structure would be expected in the event of a dam failure. The potential for loss of life is considered slight.

SECTION 6
STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

A. VISUAL OBSERVATIONS

1. Embankment: Surficial embankment deficiencies and wet zones identified in Sections 3.1-B1 and B3 are not considered to have a significant affect on dam stability. However, the seepage, observed located along the reservoir drain pipe outlet, may represent a potential hazard to the dam. As previously indicated, the cause and origin of the seepage could not be conclusively established by visual observation. It is therefore recommended the seep be periodically observed by the Grounds Superintendent to note any change in conditions.

In general, the structural condition of the dam embankment is assessed as good at the present time.

2. Appurtenant Structures: Visual observation of the spillway channel did not reveal evidence of structural distress that would significantly affect hydraulic performance or dam stability. However, a trash rack and protective screen should be provided for the 18 in. and 2 in. dia. pipe inlets respectively, to reduce the risk of clogging during an emergency.

Blockage of debris by steel column supports located in the spillway channel may create a significant flow obstruction. Such an obstruction could possibly cause complete collapse of the bridge and further flow obstruction, and/or overtopping of the dam and breach failure.

B. DESIGN AND CONSTRUCTION DATA

1. Subsurface Exploration: Four (4) test pits were excavated along the proposed centerline of the dam embankment. The test pits ranged in depth from 3 to 6 ft., and were located at dam centerline stations 0+26, 0+50, 1+70, and 2+60. Design information indicates hard clay shale was encountered beneath shallow surface soils consisting of clay, silt, and gravel. The spillway channel was reportedly excavated to shale rock.
2. Laboratory Testing: No reference to laboratory testing was found from available information sources.
3. Slope Stability Analysis: No calculations or references were found from available information. Based upon embankment geometry, visual observations, and performance history, the slope stability of the embankment is probably adequate.

- C. OPERATING RECORDS: Operating records are not maintained at the dam facility. However, the structural stability of the dam embankment and appurtenant structures is not considered to be affected by the operation of the reservoir drain plug or the 2 in. gate valve.
- D. POST-CONSTRUCTION CHANGES: There have been no reports of post-construction changes at this dam facility.
- E. SEISMIC STABILITY: No calculations or references of embankment stability were available for review. Lost Creek Dam is located in Seismic Zone 1 (low seismic probability). Based upon this low seismic probability and recommended criteria for the evaluation of seismic stability of dams, the seismic stability of the embankment is presumed to be adequate under these earthquake conditions.

SECTION 7
ASSESSMENT AND RECOMMENDATIONS

7.1 DAM ASSESSMENT

A. EVALUATION

1. Embankment: The observed deficiencies presented in Section 3.2-A are surficial in scope and are not considered to represent significant hazard to dam stability. However, the dam embankment crest should be backfilled with suitable material, compacted, and leveled to original grade. In general, dam embankment crest and slopes are adequately maintained, and appear in good condition.
2. Appurtenant Structures: Slope erosion along the spillway-embankment junction sidewall is in need of repair. Trees and woody shrubs along both spillway channel sidewalls should be removed. Also, suitable protective trash screens should be provided for the 2 in. dia. C. I. and 18 in. dia. C. M. pipe inlets.

In general, the condition of the spillway channel and appurtenances is assessed as good.

3. Overtopping Potential: U. S. Army Corps of Engineers dam safety criteria recommends a spillway design flood of 100 year to 50 percent PMF for "small" size, "significant" hazard dams. Based on the observed downstream hazard, a 50 percent PMF spillway design flood is considered appropriate for Lost Creek Dam. HEC-1 Dam Safety Version computer analyses indicate the spillway channel can pass approximately 49 percent PMF without overtopping the dam.
4. Spillway Adequacy: Overtopping analyses indicate the dam is overtopped by 0.07 ft. of water for an estimated duration of 1.0 hour for recommended 50 percent PMF spillway design flood conditions. Therefore, unobstructed spillway discharge capacity is assessed inadequate in accordance with U. S. Army Corps of Engineers dam safety criteria.

B. ADEQUACY OF INFORMATION: The construction drawings and technical specifications available for this review were of sufficient detail to adequately conduct a Phase 1 study.

C. NECESSITY FOR FURTHER INVESTIGATION: The owner should initiate a study or investigation to more accurately ascertain the potential for spillway blockage and bridge collapse, and the extent of improvements required to provide sufficient protection against spillway blockage.

D. URGENCY: The following recommendations should be implemented as soon as possible.

7.2 **RECOMMENDATIONS:** The following recommendations are presented based on the data obtained.

A. DAM AND APPURTENANT STRUCTURES

1. Implement study to more accurately ascertain the potential for spillway blockage and bridge collapse, and the extent of improvements required to provide sufficient protection against spillway blockage.
2. Monitor seepage and wet zones located downstream of the embankment toe for change in conditions. If increase flow quantity or evidence of erosion is observed, immediately notify Department of Environmental Resources, Dam Safety Division.
3. Backfill dam crest with suitable material, compact, and level to original grade.
4. Remove tree and woody shrub growth along spillway channel sidewalls and dam embankments.
5. Repair, mulch, and seed embankment surface erosion along the spillway-embankment junction sidewall.
6. Provide suitable protective trash screens for 2 in. and 18 in. dia. drain pipe inlets.
7. Develop and implement method for upstream closure of 2 in. dia. C. I. drain pipe.
8. Regrade, compact, and seed localized slope disturbance on downstream embankment slope near spillway-embankment junction.

B. OPERATION AND MAINTENANCE PROCEDURES

1. Develop a formal flood surveillance and warning plan. Plan to include, but not limited to, the following:
 - a) Surveillance: Around-the-clock surveillance of spillway channel discharge and overtopping of dam during periods of unusually heavy rainfall.
 - b) Warning System: Formal warning procedures to alert downstream residents in the event of expected high flood flows.
 - c) Evacuation Plans: Adequate emergency contingency plans to evacuate downstream residents in the event or threat of a dam failure.
2. Limit vehicular travel on dam crest or provide a suitable road surface.

APPENDIX A
VISUAL OBSERVATIONS CHECK LIST AND FIELD SKETCH

VISUAL OBSERVATION CHECK LIST

Name Dam	<u>Lost Creek Dam</u>	County	<u>Somerset</u>	State	<u>Pennsylvania</u>	National ID #	<u>PA 739</u>
Type of Dam	<u>Earthfill</u>	Hazard Category	<u>Class II - Significant Hazard</u>				
Date(s) Inspection	<u>11/20/79</u>	Weather	<u>Clear</u>	Temperature	<u>65°</u>		
Inspection Review Date	<u>3/4/80</u>						
Pool Elevation at Time of Inspection	<u>1821.5*</u>			Tailwater at Time of Inspection	<u>Normal</u>	<u>M.S.L.</u>	
Inspection Personnel:	<u>Ackenheil & Associates</u>			Representatives for Dam Owner			
Recorder	<u>Timothy Debes</u>			Rodney J. Shegan Jesse Klink			

*Estimated U.S.G.S. elevation.

EMBANKMENT

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS*</u>
SURFACE CRACKS	None observed. Embankment crest and downstream slope covered with grass. Upstream slope covered with 18 in. rock riprap.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed.	
SLoughing or erosion of embankment and abutment slopes	Minor sloughing of downstream embankment slope at embankment-spillway junction.	
Vertical and horizontal alignment of the crest	No significant vertical or horizontal misalignment observed.	
Riprap failures	None observed.	

*REFER TO REPORT SECTIONS 3 AND 7

EMBANKMENT

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
SETTLEMENT	Shallow settlement of dam crest at approach to bridge. Settlement believed attributed to vehicular traffic.	
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Minor rill erosion evident at spillway-embankment junction, along concrete spillway sidewall on the downstream embankment slope.	
ANY NOTICEABLE SEEPAGE	Clear seepage observed discharging along 18 in. pipe outlet. Ponded water observed located between 10 and 35 ft. below toe of the downstream embankment. A wet zone, measuring 25 ft. by 60 ft. was located near mid-dam about 50 ft. below the downstream embankment toe.	
STAFF GAGE AND RECORDER	None.	
DRAINS	Two (2) in. dia. cast iron pipe used for "dry weather" discharge, outlets approximately 100 ft. downstream of dam embankment. No discharge was observed.	

OUTLET WORKS
(Pond Drain)

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	None observed.	
INTAKE STRUCTURE	Submerged. Drain plug (steel plate with neoprene gasket) re- portedly operational.	
OUTLET STRUCTURE	None.	
OUTLET CHANNEL	Outlet channel is cobble lined and was observed to be stable and generally free of flow obstructions.	
EMERGENCY GATE	N/A.	

<u>UNGATED SPILLWAY</u>		<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
CONCRETE WEIR	Sharp crested weir at E.J. 1832.5.			
APPROACH CHANNEL		Approach channel observed free of debris and flow obstructions.		
DISCHARGE CHANNEL		Channel bottom and sidewalls are lined with concrete and rock riprap. Channel exits into a shallow plunge pool. Trees and woody shrubs are growing along spillway channel sidewalls.		
BRIDGE AND PIERS		Wood plank bridge located over spillway channel. Steel support columns are set into pointed-nosed concrete piers located on channel bottom. Wood planks over lay steel cross beams to form the bridge deck. Clearance between bridge deck and spillway channel is about 6.5 ft.		

GATED SPILLWAY

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
CONCRETE SILL	N/A	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE AND PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

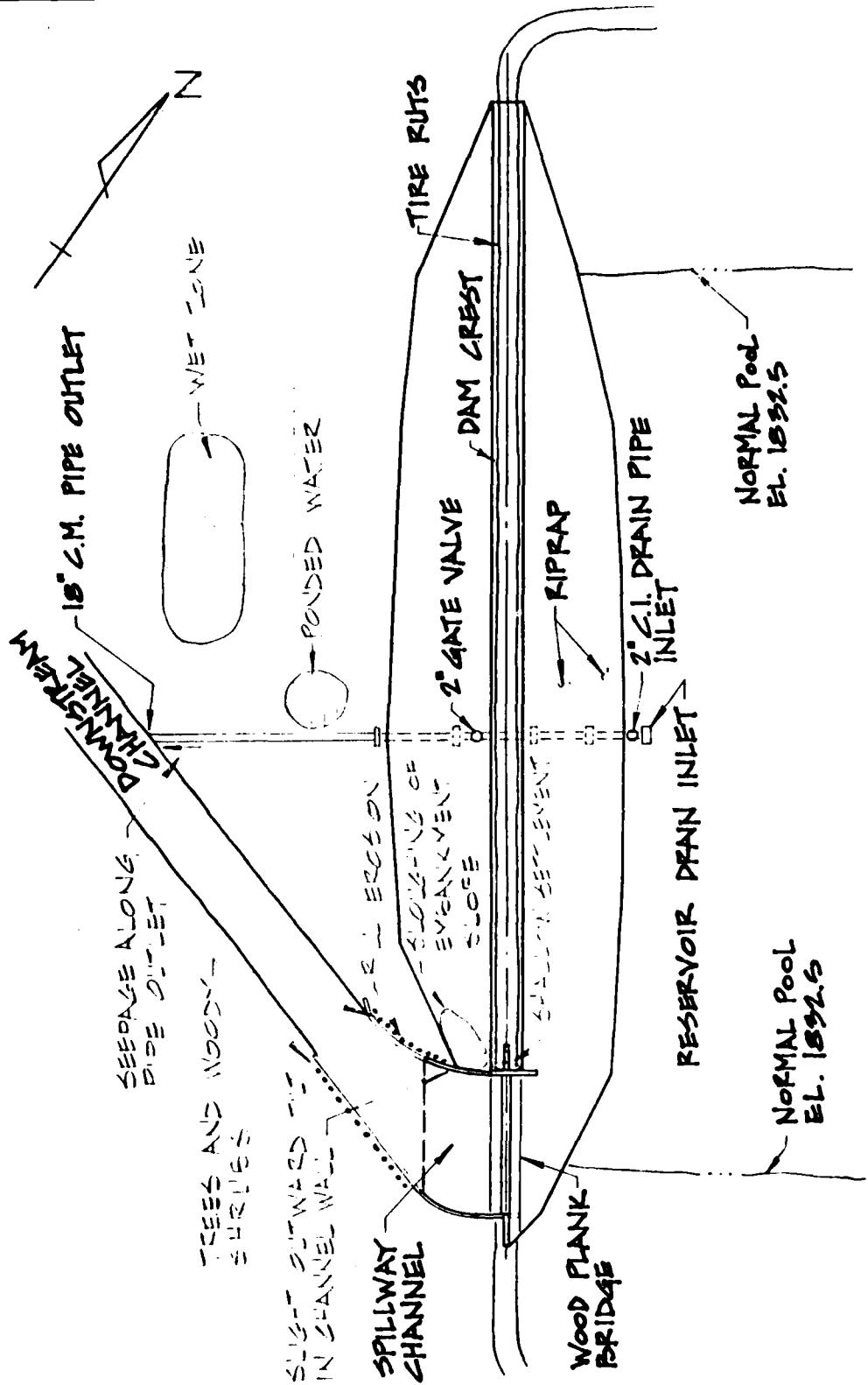
<u>INSTRUMENTATION</u>	<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
	MONUMENTATION/SURVEYS	None.	
	OBSERVATION WELLS	None.	
	WEIRS	None.	
	PIEZOMETERS	None.	
	OTHER	N/A.	

RESERVOIR

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
SLOPES	Reservoir slopes have gentle to moderate inclinations, are well vegetated, and appear stable. No evidence of landslides, embankment sloughing, or significant shoreline erosion was observed.	
SEDIMENTATION	Reservoir and spillway discharge water observed clear. Some sediment is reportedly transported into the reservoir from upstream cultivated farm lands.	

DOWNSTREAM CHANNEL

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
<u>CONDITION</u> (OBSTRUCTIONS, DEBRIS, ETC.)	None observed.	
<u>SLOPES</u>	Channel side slopes are stable, vegetated with grass and trees, and exhibit little bank erosion.	
<u>APPROXIMATE NO. OF HOMES AND POPULATION</u>	One (1) inhabited structure is located within the estimated downstream flood plain between the dam site and the Lost Creek-Laurel Hill Creek confluence.	



DATE: MARCH 21, 1980
SCALE: NONE
DR: JLM CK: TED
DWG. NO. A-10

NATIONAL DAM INSPECTION PROGRAM

ACKENHEIL & ASSOCIATES
CONSULTING ENGINEERS
BALTIMORE, MD.

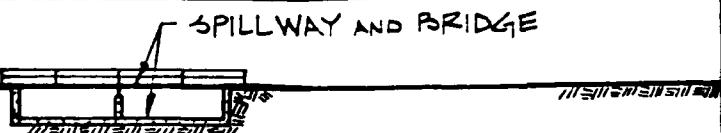
LOST CREEK
DAM FIELD
SKETCH

ELEV. (FT.)

1860

1840

1820



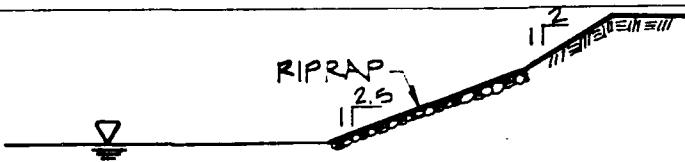
DAM CREST
1'-10"

ELEV. (FT.)

1840

1830

1820

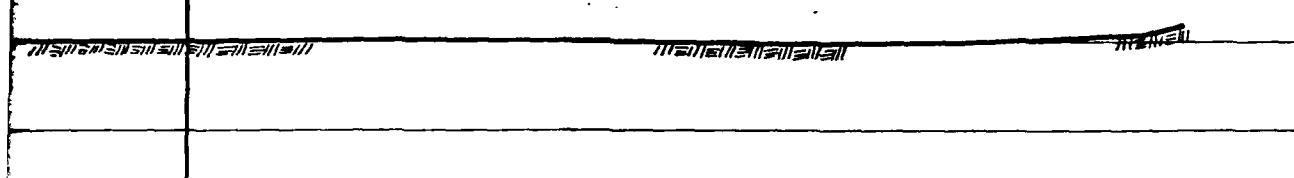


SECTION
1'-10"

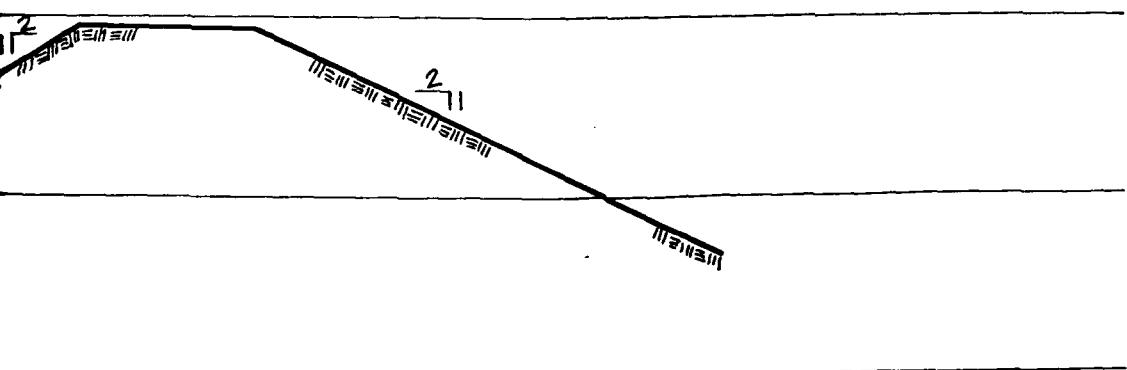
NOTE:

ASSUMED DATUM ELEV. 1832.5 ON
TOP OF WIER

Y
A



CREST PROFILE



SECTION A-A

10'

DATE: MARCH 21, 1980
SCALE: AS SHOWN
DR: JLM CK: JG
DWG. NO. A-11

NATIONAL DAM INSPECTION PROGRAM

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CONSULTING ENGINEERS
BALTIMORE, MD.

LOST CREEK
DAM

APPENDIX B
CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE 1

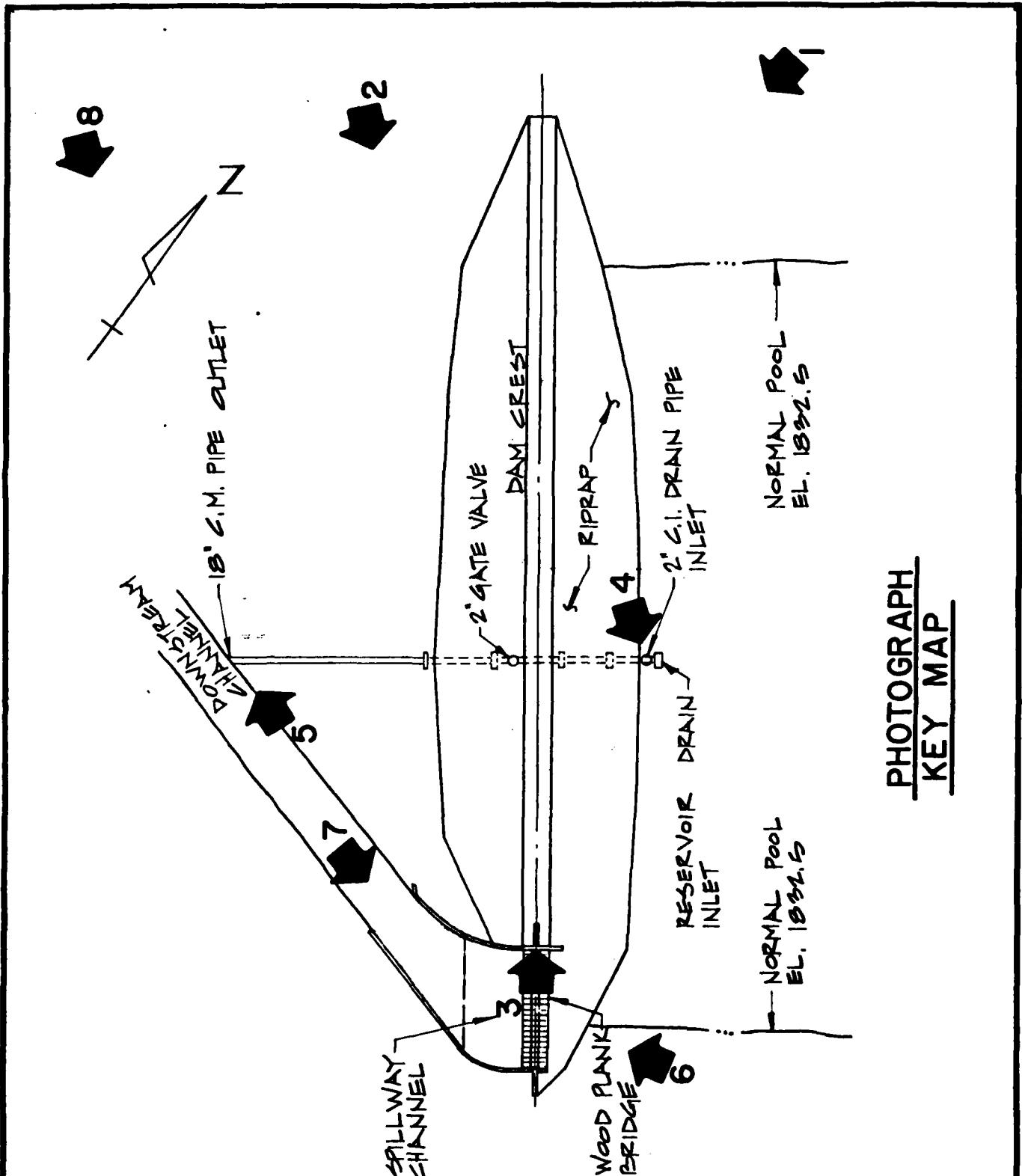
CHECK LIST		NAME OF DAM	LOST CREEK DAM
ENGINEERING DATA		ID #	PA 739
DESIGN, CONSTRUCTION, OPERATION			
ITEM			REMARKS
AS-BUILT DRAWINGS			No as-built drawings are available. Construction drawings were provided by the Pennsylvania Department of Environmental Resources, Dam Safety Division, Harrisburg, Pennsylvania.
REGIONAL VICINITY MAP			See Appendix E, U.S.G.S. 7.5 minute quadrangle map showing dam site location.
CONSTRUCTION HISTORY			Construction drawings and technical specifications were prepared by Neilan Engineers, Somerset, Pennsylvania. Construction of the dam embankment and appurtenances was performed by Lomb, Collins, and Troll Contractors, Somerset, Pennsylvania, and completed August 6, 1954.
TYPICAL SECTIONS OF DAM			See Plate Nos. 1 and 3.
OUTLETS - PLAN DETAILS			See Plate No. 2. See Plate No. 3.
CONSTRAINTS			Bridge overtop spillway channel. Clearance between bridge deck and spillway channel bottom is 6.55 ft.
DISCHARGE RATINGS			
RAINFALL/RESERVOIR RECORDS			None.

ITEM	REMARKS
DESIGN REPORTS	None.
GEOLOGY REPORTS	None.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None.
POST-CONSTRUCTION SURVEYS OF DAM	None reported.
BORROW SOURCES	Soil for dam embankment obtained from spillway channel excavation and borrow pits located within reservoir site limits.

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	<ol style="list-style-type: none"> 1. Wood plank bridge constructed over spillway channel. 2. Spillway channel extended to beyond downstream embankment toe. 3. Two (2) in. gate valve box with extended stem not installed.
HIGH POOL RECORDS	Normal pool level rose 2 ft. \pm during Tropical Storm Hazel.
POST-CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None.
MAINTENANCE OPERATION RECORDS	None.

ITEM	REMARKS
SPILLWAY PLAN	See Plate No. 2.
SECTIONS	See Plate No. 3.
DETAILS	See Plate Nos. 2 and 3.
OPERATING EQUIPMENT PLANS & DETAILS	Reservoir drain plug (steel plate with neoprene gasket) is shown on Plate No. 3 (see also Field Sketch in Appendix A).
SPECIFICATIONS	Technical specifications prepared by Neilan Engineers, Somerset, Pennsylvania.
MISCELLANEOUS	Elevations shown on design drawings are site specific. Spillway weir crest El. 18.5 corresponds to an estimated U.S.G.S. elevation of 1832.5 ft.

APPENDIX C
PHOTOGRAPHS



DATE: MARCH 21, 1980
SCALE: NONE
DR: JLM CK: TED
DWG. NO. C-1

NATIONAL DAM INSPECTION PROGRAM

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BALTIMORE, MD.

LOST CREEK
DAM SITE

PHOTOGRAPH 1 Overview of upstream embankment slope from right abutment.

PHOTOGRAPH 2 Overview of downstream embankment slope from right abutment.

PHOTOGRAPH 3 Overview of dam crest from spillway-embankment junction: note tire ruts.

PHOTOGRAPH 4 Reservoir drain and "dry weather" discharge pipe inlets.



2



1



3

Page C-2

4

PHOTOGRAPH 5 Reservoir drain outlet.

PHOTOGRAPH 6 Spillway approach channel and wood plank bridge.

PHOTOGRAPH 7 Upstream view of spillway channel.

PHOTOGRAPH 8 Overview of downstream channel, spillway, and dam embankment in background.



6



8



5



7

APPENDIX D

HYDROLOGIC AND HYDRAULIC
ENGINEERING AND
COMPUTER DATA

LOST CREEK DAM
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: Approximately 70% forest, 25% pasture,

5% rural development

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 1832.5 ft. (77 ac.-ft.)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 1839.4 ft. (270 ac.-ft.)

ELEVATION MAXIMUM DESIGN POOL: 1839.4 ft.

ELEVATION TOP DAM: 1839.4 ft.

EMERGENCY SPILLWAY

- a. Elevation Weir crest at El. 1832.5
- b. Type Concrete lined rectangular channel
- c. Width 45 ft. at weir crest
- d. Length 75 ft.
- e. Location Spillover Left abutment
- f. Number and Type of Gates None

OUTLET WORKS

- a. Type 18 in. dia. C.M. pipe and 2 in. dia. C.I. pipe encased in concrete
- b. Location 155 ft. north of left abutment
- c. Entrance Inverts C.M. pipe - 1823.6 C.I. pipe - 1824.5
- d. Exit Inverts C.M. pipe - 1820+ C.I. pipe - 1820+
- e. Emergency Drawdown Facilities Steel plate and neoprene gasket plug controls 18 in. dia. C.M. pipe; 2 in. gate valve controls 2 in. dia. C.I. pipe (valve located downstream of dam crest).

HYDROMETEOROLOGICAL GAGES

- a. Type None
- b. Location
- c. Records

MAXIMUM NON-DAMAGING DISCHARGE Est. 3025 cfs

**HEC-1-DAM SAFETY VERSION
HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE**

NAME OF DAM:	Lost Creek Dam
Probable Maximum Precipitation (PMP)	24.0 in.* (unadjusted)
Drainage Area	3.0 sq. mi.
Reduction of PMP Rainfall for Data Fit Reduce by 20%, therefore PMP rainfall =	19.2 in.
Adjustments of PMF for Drainage Area	102%
6 hrs.	120%
12 hrs.	130%
24 hrs.	140%
48 hrs.	
Snyder Unit Hydrograph Parameters	
Zone	25**
C_p	0.4
C_t	1.0
L	2.92 mi.
L_{ca}	1.33 mi.
$t_p = C_t (L \cdot L_{ca})^{0.3} =$	1.50 hrs.
Loss Rates	
Initial Loss	1.0 in.
Constant Loss Rate	0.05 in./hr.
Base Flow Generation Parameters	
Flow at Start of Storm	1.5 cfs/sq. mi. = 4.42 cfs
Base Flow Cutoff	0.05 Q_p
Recession Ratio	2.0
Spillway Channel Data	
Crest Length	45 ft.
Freeboard	6.9 ft.
Discharge Coefficient	3.75
Exponent	1.5
Discharge Capacity	3,025 cfs

***Hydrometeorological Report 33**

****Hydrological zone defined by Corps of Engineers, Baltimore District,
for determining Snyder's Coefficients (C_p and C_t).**

1. NGS
DATE 13 FEB 80
CONTRACTOR TED
DUE DATE 21 MAR 80

ACKENHEIL & ASSOCIATES
CONTRACTORS IN THE
ESTATE OF MARYLAND

PROJECT N 79067

2. LOST CREEK DAM

LAKE STORAGE VOLUME VERSUS WSEL

1. LAKE SURFACE AREAS BY PLANIMETER OF CONTOURS ON
TOPO BY ROSS EXCEPT FOR WSEL = 1840' & 1860'
WHICH WERE PLANIMETERED FROM USGS 7 1/2' QUAD
SHEET. AREA FOR WSEL = 1832.5' WAS TAKEN FROM
A REPORT BY G.E. THOMAS (1953), AND AREA FOR
WSEL = 1839.4 WAS INTERPOLATED.

2. $\Delta V = \frac{h}{3} (A_1 + \sqrt{A_1 A_2} + A_2)$

WSEL (ft.)	h (ft.)	LAKE AREA (acres)	ΔV (AF)	STORAGE VOL. (AF)
1820.5	1.5	0	0.02	
1822	2	0.05	1.22	0.02
1824	2	1.5	5.30	1.24
1826	2	4.0	12.76	6.54
1828	2	9.1	22.67	19.30
1830	2	13.1	27.78	41.37
1832	0.5	14.7	8.23	69.15
1832.5	6.9	18.3	193	77.38
1839.4	0.6	39	23.61	270.4
1840	20	39.7	1622	294
1860		131.4		1916

A1 NON-BREACH ANALYSIS OF LOST CREEK DAM
 A2 MIDDLECREEK TWP. SOMERSET CO., PA.
 A3 SNYDER UH., RATIOS OF PMP, MOD PULS ROUTING, & SERVICE OUTLET CLOSED 4
 B 300 0 10
 B1 5
 J 1 9 1
 J1 0.2 0.4 0.5 0.6 0.7 0.75 0.8 0.9 1.0
 K LAKE 1
 K1 COMPUTATION OF INFLOW HYDROGRAPH TO LOST CREEK DAM 1
 M 1 1 3.0
 P 24.0 102 120 130 140
 T 1 0.05
 W 1.5 0.4
 X -1.5 -0.05 2.0
 K 1 1
 K1 MOD PULS ROUTING OF FLOW THROUGH LOST CREEK DAM SPILLWAY 1
 Y 1 1
 Y1 1 77
 \$S 0 41 69 77 270 294 1916
 \$E1820.5 1830 1832 1832.5 1839.4 1840 1860
 \$\$1832.5 44.5 3.75 1.5
 \$D1839.4 3.1 1.5 325
 \$L 120 265 280 300 320 350
 \$V1839.4 1839.5 1840 1840.6 1842 1844
 K 99
 A
 A
 A
 A
 A
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 //ENDDATASET
 //ENDPROCESS
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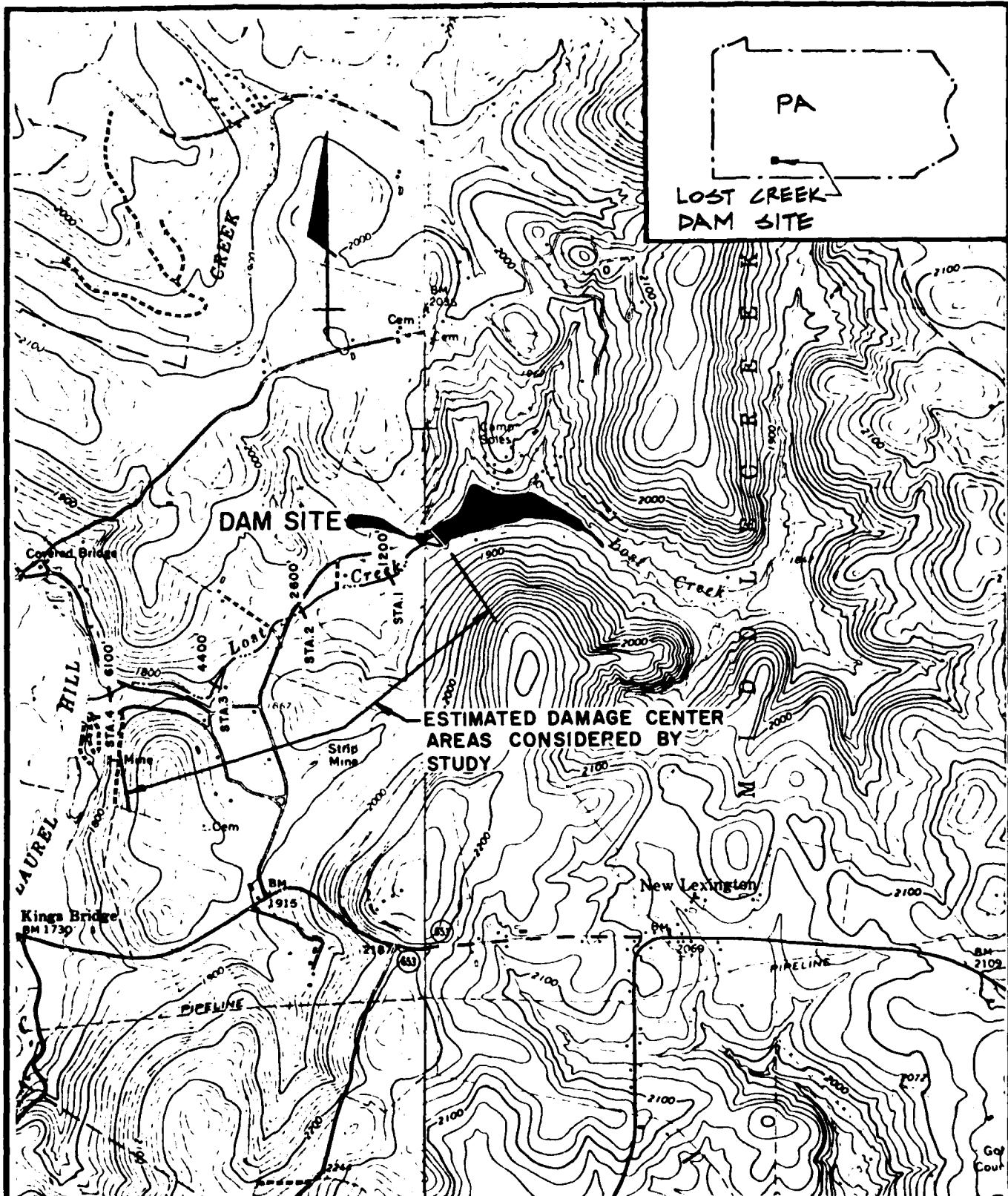
COMPUTER INPUT - OVERTOPPING ANALYSIS

D- 4

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	ELEVATION STORAGE OUTFLOW	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM	
				1832.50	1839.40
		77.	77.	270.	270.
		0.	0.	3025.	3025.
RATIO OF RESERVOIR W.S.ELEV PMF	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS
.20	1836.23	0.00	181.	1200.	0.00
.40	1838.50	0.00	245.	2455.	0.00
.50	1839.47	.07	273.	3078.	1.00
.60	1839.99	.59	294.	3778.	2.67
.70	1840.32	.92	320.	4353.	3.67
.75	1840.47	1.07	332.	4666.	3.83
.80	1840.62	1.22	345.	4985.	4.17
.90	1840.91	1.51	367.	5626.	4.67
1.00	1841.17	1.77	389.	6278.	5.33
					41.67
					0.00
					0.00
					0.00
					0.00
					0.00

APPENDIX E
LOCATION PLAN AND PLATES



DATE: MARCH 21, 1980
SCALE: 1:24000

DR: JLM CK: TED

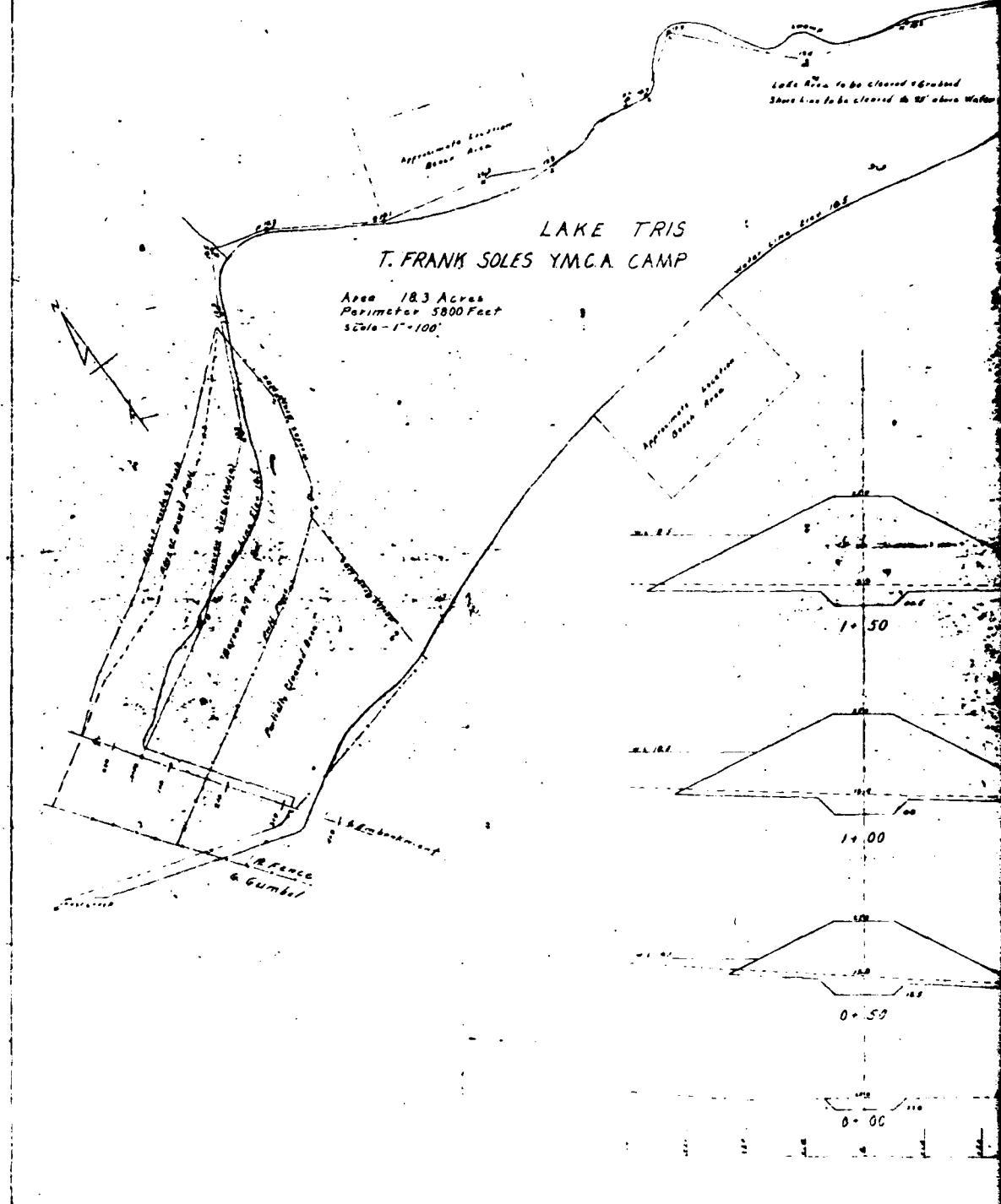
DWG. NO. E-1

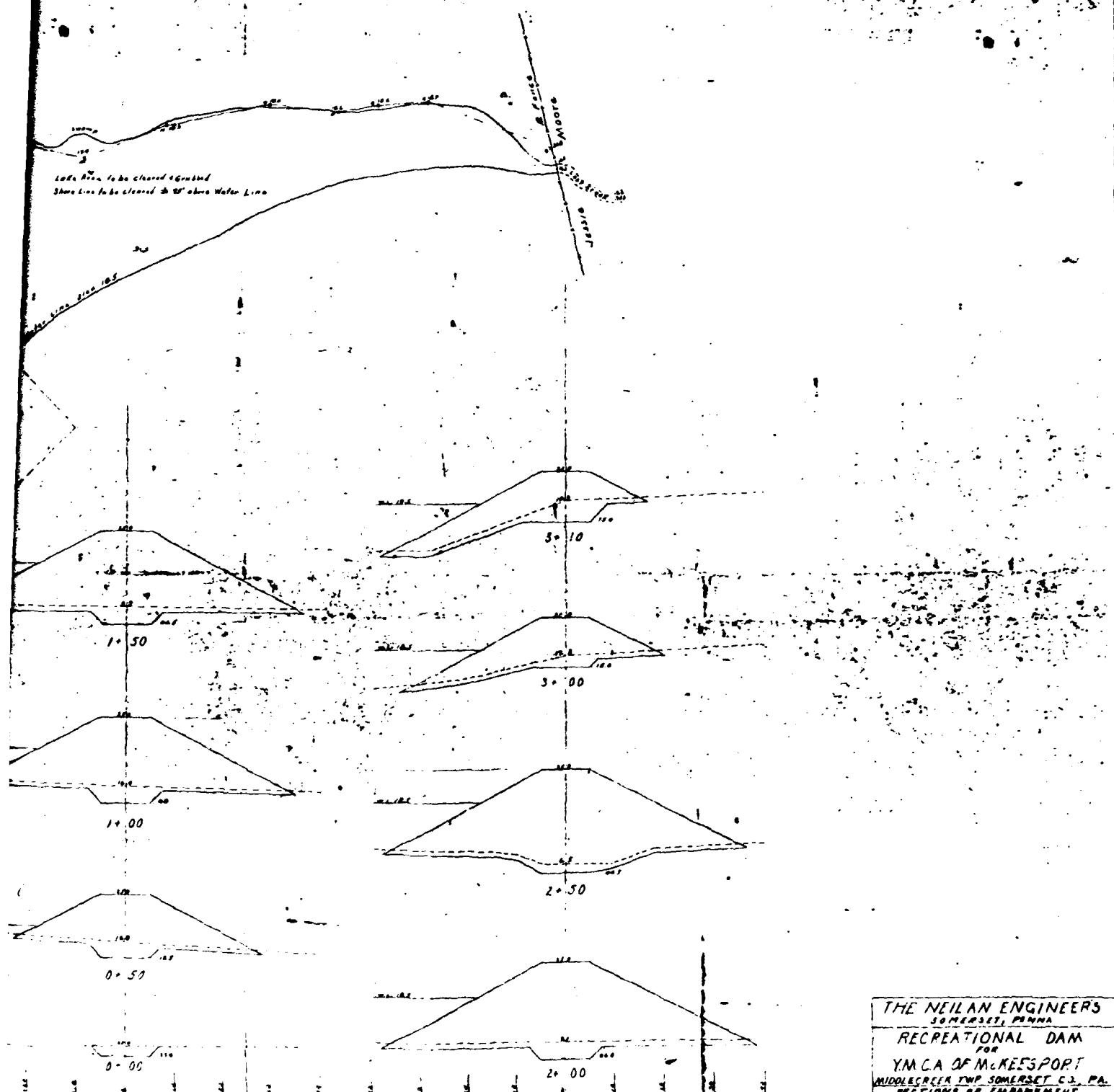
SWR NO. 2

NATIONAL DAM INSPECTION PROGRAM

**ACKENHEIL & ASSOCIATES
CONSULTING ENGINEERS
BALTIMORE, MD.**

LOCATION PLAN OF LOST CREEK DAM SITE

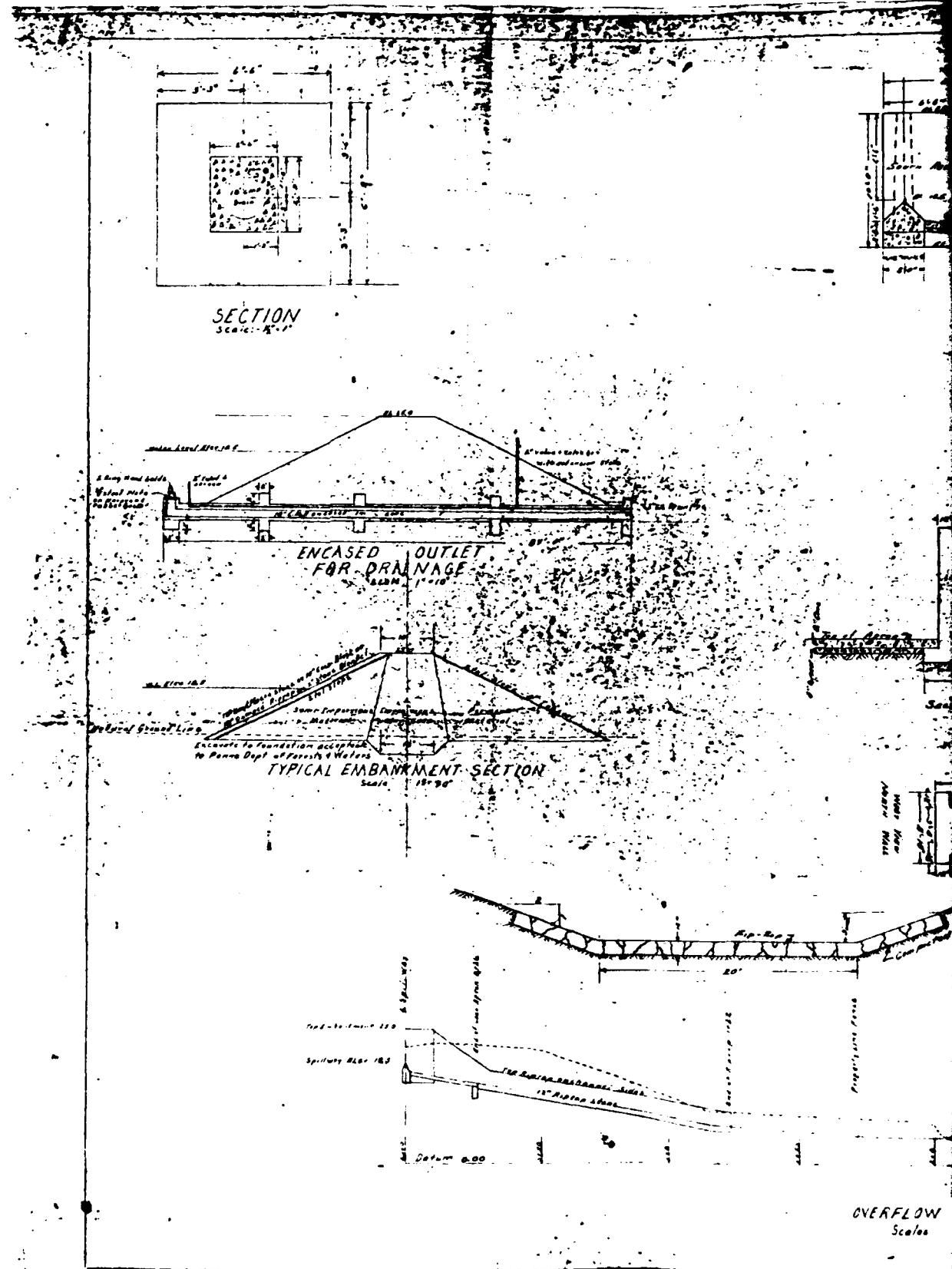




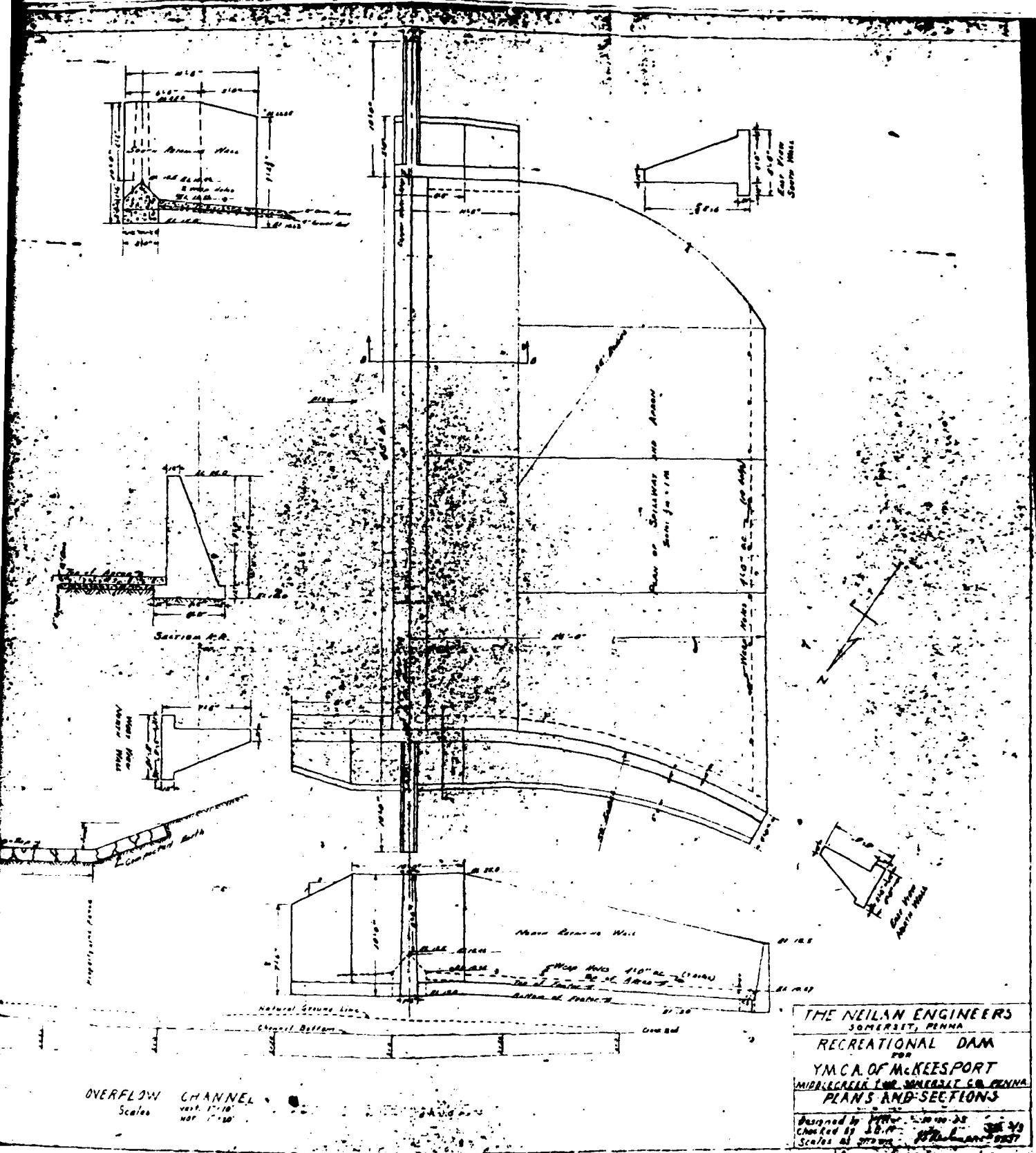
THE NEILAN ENGINEERS
SOMERSET, PENNA
RECREATIONAL DAM
FOR
Y.M.C.A. OF MCKEESPORT
MIDDLECREEK TWP. SOMERSET, C.J. PA.
SECTIONS OF EMBANKMENT
PLAN OF LAKE
Drawn by F.W. 10-10-58 SH 1/3
checked by F.W.N. 10-10-58
Scale 1:1000 DRAWN BY F.W.N. APPROVED
SOMERSET, PA. 10-10-58

PLATE NO. 1





OVERFLOW Scales



THE NEILAN ENGINEERS
SOMERSET, PENNA
RECREATIONAL DAM
YMCA OF MCKEESPORT
MIDDLECREEK TOWNSHIP, PENNA
PLANS AND SECTION
Designed by J. H. NEILAN - 1940-25
checked by J. H. NEILAN - 1940-25
Scales as given - 10000-100000-1000000

PLATE NO. 3

APPENDIX F
REGIONAL GEOLOGY

LOST CREEK DAM
NDI ID. NO. PA 739
REGIONAL GEOLOGY

Lost Creek Dam is located approximately 1.25 miles northwest of New Lexington, Pennsylvania in the Allegheny Mountain section of the Appalachian Plateau Province. This section of the plateau contains flexures of moderate intensity having a dominant trend between north 30° east and north 35° east.

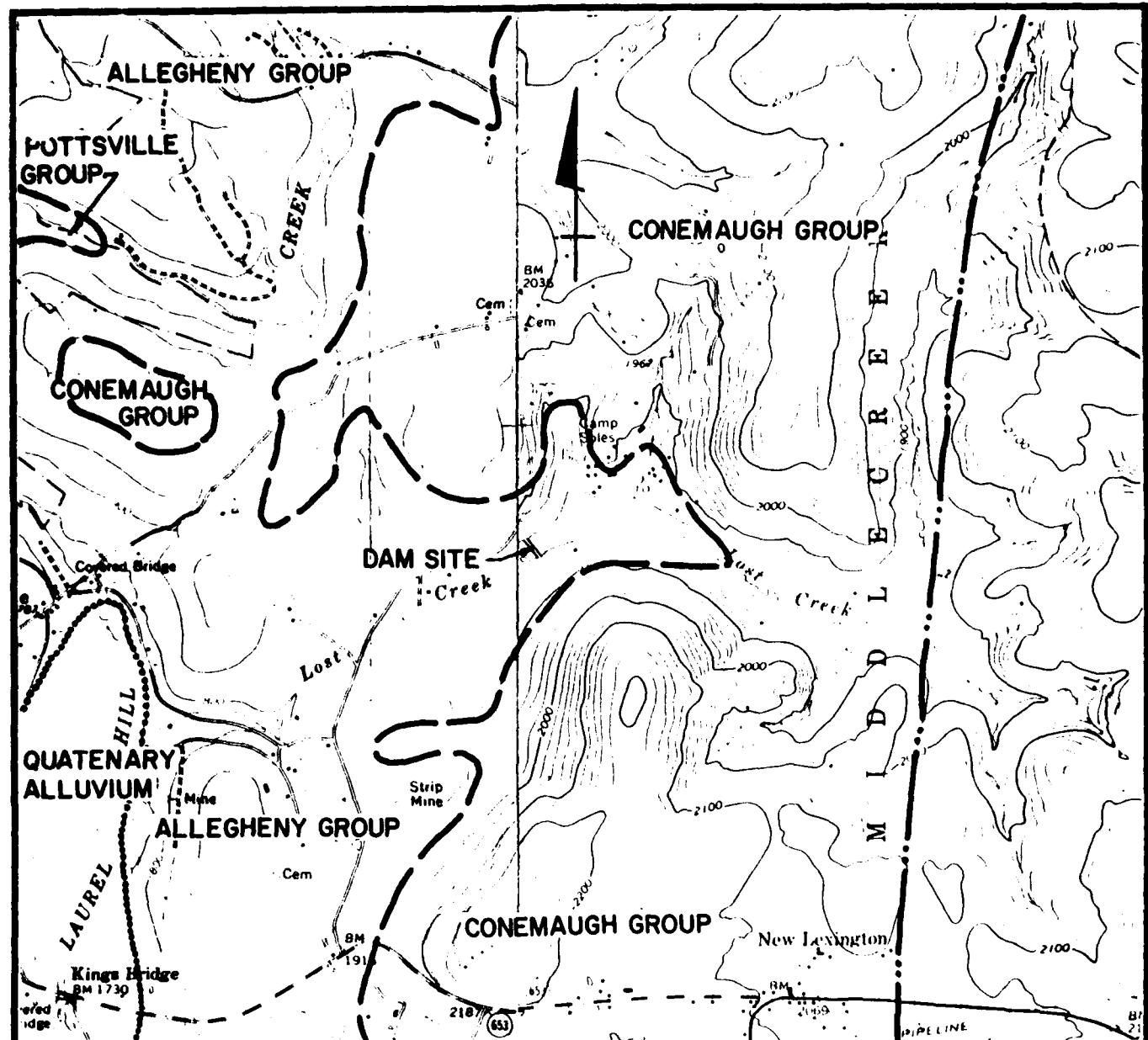
There is no evidence of faulting on the land surface in this area. However, considerable faulting occurs at depths over 3,000 ft. Based on the depth of the faults, these faults are not considered to present a significant hazard to the dam.

Lost Creek Dam is situated about 1 mile west of the New Lexington Syncline axis. The western flank of this syncline dips gently to the southeast. The dam embankment overlies the Freeport Formation of the Allegheny Group which consists of alternating layers of shale, sandstone, coal, and clay. The Freeport Formation also contains the mineable Upper and Lower Freeport coal seams. However, no mining activities have been recorded in the immediate area of the dam site.

Four (4) test pits were excavated along the proposed dam centerline prior to construction of the dam. These test pits indicated the dam embankment is underlain by hard clay and shale.

References

Geology and Mineral Resources of Southern Somerset County, Pennsylvania,
Norman L. Flint, Pennsylvania Geological Survey, 1965, County Report
56A.



ROCKWOOD & KINGWOOD QUADRANGLES, SOMERSET COUNTY PENNSYLVANIA

SCALE:  1:24000

CONTOUR INTERVAL 20FT. DATUM IS MEAN SEA LEVEL

— — — — — INFERRED GROUP CONTACTS

— — — — — NEW LEXINGTON SYNCLINE

DATA OBTAINED FROM PENNSYLVANIA GEOLOGICAL SURVEY'S GEOLOGIC MAP OF SOMERSET COUNTY, 1968
REVISED 1973

FILE: MARCH 21, 1980	NATIONAL DAM INSPECTION PROGRAM		SITE GEOLOGY OF LOST CREEK DAM
SCALE: AS SHOWN			
DR: JLM	CK: GRG	ACKENHEIL & ASSOCIATES CONSULTING ENGINEERS BALTIMORE, MD.	
DWG. NO.	F-2		

DATE
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